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WHITE SANDS MISSILE RANGE, NEW MEXICO.

DR-410
March 1969
AD

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METEOROLOGICAL DATA REPORT

WHITE-SNDAC 3TV-84
(27 February 1969)

BY

GORDON L. DEMARAY

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REF ID: A64747
APR 8 1969
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ATMOSPHERIC SCIENCES OFFICE
WHITE SANDS MISSILE RANGE, NEW MEXICO

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UNITED STATES ARMY ELECTRONICS COMMAND

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METEOROLOGICAL DATA REPORT

NIKE-HYDAC STV-84
(27 February 1969)

By

Gordon L. Dunaway

DR-410

March 1969

DA Task 1T665702D127-02

ATMOSPHERIC SCIENCES OFFICE
WHITE SANDS MISSILE RANGE, NEW MEXICO

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ABSTRACT

Meteorological data gathered for the launching of Nike-Hydac STV-84 are presented for the Space and Missile Systems Organization, AFMDC, Holloman Air Force Base, New Mexico, and for ballistic studies. The data appear, along with calculated ballistic data, in tabular form.

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INTRODUCTION

Nike-Hydac STV-84 was launched from Launch Complex 33, L-314, White Sands Missile Range (WSMR), New Mexico, at 0914 hours MST, 27 February 1969.

Meteorological data used in conjunction with theoretical calculations to predict rocket impact were collected by the Meteorological Support Technical Area, Atmospheric Sciences Office (ASO), WSMR, New Mexico. The Ballistic Meteorologists for this firing were Gordon L. Dunaway and SP/6 George Anderson.

DISCUSSION

Wind data for the first 216 feet above the surface were obtained from a system composed of Five Aerovanes mounted on a 200-foot tower and cabled to component wind indicators.

From 216 to 4,270 feet above the surface, wind data were obtained from T-9 Radar-tracked balloon ascent.

Temperature, pressure and humidity data, along with upper wind data from the surface to 100,000 feet above the surface, were obtained from standard rawinsonde observations.

Mean wind component values in each ballistic zone were determined from vertical cross sections by the equal-area method.

Theoretical rocket performance values and ballistic factors as a function of altitude were provided by ASO and are the basis for data appearing in Table I.

PAYLOAD		230	Pounds
CORIOLIS DISPLACEMENT	WEST	4.7	Miles
SECOND-STAGE IGNITION	TIME	20.0	Seconds
	ALTITUDE	35,880	Feet MSL
PEAK	TIME	232	Seconds
	ALTITUDE	702,500	Feet MSL
UNIT WIND EFFECT	HEAD	2.158	Miles/MPH
	CROSS	2.244	Miles/MPH
	TAIL	2.167	Miles/MPH
TOWER TILT EFFECT		14.5	Miles/Degree

TABLE I. THEORETICAL ROCKET PERFORMANCE VALUES
NIKE-HYDAC STV-84

LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTORS	LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTORS	LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTORS
11- 60	.135	860- 1000	.039	16000-21000	-.018
60-108	.075	1000- 1400	.071	21000-26000	-.012
108-148	.070	1400- 2000	.065	26000-31880	-.012
148-184	.031	2000- 2500	.031	31880-36000	.132
184-216	.029	2500- 3000	.027	36000-41000	.058
216-300	.052	3000- 3500	.010	41000-46000	.032
300-400	.048	3500- 4270	.009	46000-56000	.018
400-600	.082	4270-11000	-.024	56000-66000	.011
600-800	.058	11000-16000	-.018	66000-72260	.001

TABLE II. BALLISTIC FACTORS
NIKE-HYDAC STV-84

AERO-VANE NO. *	MEAN WIND COMPONENTS IN MILES PER HOUR							
	1 0700 MST		2 0730 MST		3 0800 MST		4 0815 MST	
	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
1	3.0N	0.0	2.0N	2.0E	8.0N	4.0E	14.0N	3.0E
2	5.0	2.0E	4.0	4.0	10.0	6.0	15.0	3.0
3	6.0	0.0	6.0	3.0	12.0	6.0	16.0	3.0
4	6.0	1.0W	7.0	2.0	13.0	10.0	17.0	5.0
5	6.0	3.0	6.0	0.0	14.0	9.0	16.0	6.0

AERO-VANE NO. *	MEAN WIND COMPONENTS IN MILES PER HOUR							
	6 0845 MST		7 0855 MST		8 0905 MST		9 0914 MST	
	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
1	18.0N	2.0E	10.0N	3.0E	12.0N	2.0E	15.0N	3.0E
2	17.0	2.0	15.0	8.0	15.0	4.0	18.0	3.0
3	16.0	4.0	20.0	9.0	19.0	6.0	20.0	3.0
4	20.0	4.0	20.0	10.0	19.0	7.0	20.0	3.0
5	22.0	2.0	20.0	7.0	18.0	8.0	20.0	3.0

TABLE III. ANEMOMETER WIND SPEED AND DIRECTION
NIKE-HYDAC STV-84

* Height corresponding to Aerovane Numbers: 1 = 35 Feet 3 = 128 Feet 5 = 200 Feet
2 = 88 Feet 4 = 168 Feet

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN MILES PER HOUR							
	1 0700 MST		2 0730 MST		3 0800 MST		4 0815 MST	
	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
216- 300	4.0N	1.0W	6.0N	3.5W	15.0N	9.0E	16.5N	5.5E
300- 400	5.0	5.0	6.0	10.5	17.0	8.0	18.0	4.5
400- 600	6.5	11.0	7.5	13.0	17.5	8.5	20.0	5.5
600- 800	7.0	13.0	8.5	13.5	13.0	7.5	23.0	7.0
800-1000	7.0	13.0	7.0	12.0	11.0	5.0	24.0	7.0
1000-1400	11.0	15.5	9.0	12.0	9.0	1.5	17.5	3.5
1400-2000	14.0	17.5	14.0	11.0	7.0	9.5W	12.0	0.0
2000-2500	15.5	17.0	17.5	11.5	9.0	9.0	8.0	7.0W
2500-3000	15.5	15.0	17.0	17.5	13.0	8.5	10.0	8.0
3000-3500	13.5	20.0	16.0	22.0	13.0	10.0	10.5	11.0
3500-4270	10.5	23.0	11.0	22.0	11.0	15.5	9.5	17.0
								15.0

TABLE IV. PILOT-BALLOON-MEASURED WIND DATA
NIKE-HYDAC STV-84

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN MILES PER HOUR							
	6 0845 MST		7 0855 MST		8 0905 MST		9 0914 MST	
	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
216- 300	22.0N	2.5E	20.0N	7.0E	21.5N	5.5E	21.0N	4.0E
300- 400	22.0	3.5	20.0	6.5	19.0	3.0	22.0	4.5
400- 600	21.5	6.0	20.0	5.5	17.0	3.5	24.0	4.5
600- 800	23.0	6.0	20.5	6.0	22.0	6.0	27.5	6.0
800-1000	26.0	4.5	26.0	7.0	26.0	4.5	27.0	4.5
1000-1400	24.0	3.5	29.0	5.5	25.0	4.0	25.0	5.0
1400-2000	15.5	2.0	22.0	3.0	20.0	3.0	17.5	2.0
2000-2500	9.0	3.0W	11.0	0.0	14.0	1.0W	8.0	2.5W
2500-3000	8.5	9.5	8.0	10.0W	8.0	6.0	8.0	7.0
3000-3500	9.0	12.5	8.0	12.5	4.5	12.5	8.5	12.0
3500-4270	7.0	15.0	5.5	16.0	6.0	16.0	8.0	19.0

TABLE XV. PILOT-BALLOON-MEASURED WIND DATA (CONT)
NIKE-HYDAC STV-84

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN KNOTS					
	1 0600 MST		2 0900 MST			
	N-S	E-W	N-S	E-W	N-S	E-W
4270-11000	8.5N	23.0W	9.0N	24.5W		
11000-16000	12.0	33.0	14.0	24.5		
16000-21000	13.0	35.5	16.5	28.5		
21000-26000	8.5	49.0	24.5	42.5		
26000-31880	9.0	51.0	19.0	52.5		
31880-36000	0.0	68.0	13.0	73.0		
36000-41000	0.0	80.0	0.0	80.0		
41000-46000	0.0	68.0	0.0	75.0		
46000-56000	0.0	45.0	0.0	53.0		
56000-66000	0.0	8.0	3.5N	19.5		
66000-72260	0.0	21.0	2.0	12.0		

TABLE V. RAWINSONDE-MEASURED WIND DATA
NIKE-HYDAC STV-84

STATION ALTITUDE 3989.0 FEET MSL
27 FEB. 69 0600 HRS MST
ASCENSION NO. 197

SIGNIFICANT LEVEL DATA
0825003905
WHITE SANDS SITE

TABLE VI

WSTM SITE COORDINATES
E 488°580 FEET
N 185,045 FEET

PRESSURE MILLIBARS	GEOMETRIC ALTITUDE MSL FEET	TEMPERATURE AIR DEWPOINT DEGREES CENTIGRADE	REL. HUM. PERCENT
877.3	3989.0	8.0	-2.9 46.0
867.0	4310.8	11.1	-0.7 44.0
714.0	9505.8	-2.1	-9.1 59.0
697.0	10135.8	-1.4	-20.4 22.0
681.0	10743.8	-1.0	-26.0 13.0
469.0	20133.3	-22.2	-39.7 20.0
375.0	25402.3	-35.0	-49.3 22.0
301.0	30369.6	-42.3	0. -0. **
274.0	32433.6	-48.4	0. -0. **
244.0	34917.1	-53.7	0. -0. **
234.0	35805.8	-52.2	0. -0. **
166.0	43040.3	-57.2	0. -0. **
159.0	43939.2	-56.8	0. -0. **
98.0	53787.0	-67.9	0. -0. **
82.0	57072.8	-69.0	0. -0. **
76.0	58829.2	-64.8	0. -0. **
62.0	62927.0	-65.1	0. -0. **
60.0	63593.8	-60.7	0. -0. **
56.0	65007.0	-62.0	0. -0. **
50.0	67344.7	-57.8	0. -0. **
44.0	71962.6	-60.7	0. -0. **
38.0	73024.0	-58.0	0. -0. **
30.0	77916.4	-60.7	0. -0. **
18.0	85594.9	-53.9	0. -0. **
5.8	101862.7	-42.2	0. -0. **
6.4	111616.3	-32.3	0. -0. **

** RELATIVE HUMIDITY NOT SUPPLIED. ZERO VALUE ASSUMED FOR COMPUTATIONS.

STATION ALTITUDE 3989.0 FEET MSL
27 FEB. 69 C600 HRS MSL
ASCENSION NO. 197

UPPER AIR DATA
0825003905
WHITE SANDS SITE

WEST SITE COORDINATES
E 498.580 FEET
N 185.045 FEET

TABLE VII

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREE CENTIGRADE	DEWPOINT DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SOUND OF SOUND KNOTS	WIND DATA		INDEX OF REFRACTION
							DIRECTION DEGREES(TIN)	SPEED KNOTS	
3929.0	871.3	8.0	-2.9	46.0	1084.9	653.6	0.	0.	1.000265
4000.0	876.9	8.1	-2.8	45.9	1084.0	653.7	359.7	0.1	1.000265
4500.0	860.9	10.6	-0.9	44.5	1054.4	656.7	344.0	4.1	1.000262
5000.0	845.0	9.3	-1.7	46.0	1039.6	655.2	328.4	8.1	1.000257
5500.0	829.3	8.1	-2.4	47.4	1025.0	653.7	312.8	12.0	1.000253
6000.0	814.0	6.8	-3.2	48.9	1010.7	652.2	297.1	16.0	1.000249
6500.0	798.9	5.5	-4.0	50.3	996.6	650.7	292.0	18.1	1.000244
7000.0	784.1	4.3	-4.8	51.8	982.7	649.2	290.4	19.4	1.000240
7500.0	769.6	2.0	-5.6	53.2	969.1	647.7	289.3	19.8	1.000236
8000.0	755.3	1.7	-6.5	54.7	955.6	646.2	287.6	20.3	1.000232
8500.0	741.4	0.5	-7.3	56.1	942.4	644.7	285.2	20.8	1.000228
9000.0	727.6	-0.8	-8.2	57.5	929.3	643.1	282.8	22.2	1.000224
9500.0	714.2	-2.1	-9.1	59.0	916.4	641.6	280.3	23.9	1.000220
10000.0	700.6	-1.6	-16.9	30.0	898.0	642.0	278.8	25.4	1.000208
10500.0	687.4	-1.2	-23.4	16.6	880.1	642.3	277.4	26.8	1.000201
11000.0	674.1	-1.6	-26.3	13.2	864.5	641.8	277.6	27.7	1.000196
11500.0	660.8	-2.7	-26.9	13.6	851.1	640.5	277.9	28.6	1.000193
12000.0	647.9	-3.8	-27.6	13.9	837.8	639.1	280.0	29.0	1.000190
12500.0	635.1	-5.0	-28.2	14.3	824.8	637.8	282.5	29.3	1.000187
13000.0	622.6	-6.1	-28.8	14.7	812.0	636.4	285.6	29.3	1.000184
13500.0	610.4	-7.2	-29.5	15.1	799.5	635.1	288.9	29.0	1.000181
14000.0	598.4	-8.4	-30.2	15.4	787.1	633.7	291.3	28.9	1.000178
14500.0	586.6	-9.5	-30.9	15.8	774.9	632.4	293.3	29.0	1.000175
15000.0	575.1	-10.6	-31.5	16.2	763.0	631.0	294.4	28.5	1.000172
15500.0	563.8	-11.7	-32.2	16.5	751.2	629.6	295.0	27.8	1.000170
16000.0	552.7	-12.9	-33.0	16.9	739.6	628.3	294.1	28.3	1.000167
16500.0	541.8	-14.0	-33.7	17.3	728.3	626.9	294.3	29.1	1.000164
17000.0	531.2	-15.1	-34.4	17.7	717.1	625.5	295.5	30.3	1.000162
17500.0	520.7	-16.3	-35.1	18.0	706.1	624.2	296.2	32.5	1.000159
18000.0	510.5	-17.4	-35.9	18.4	695.2	622.0	296.3	34.5	1.000156

STATION ALTITUDE 3989.0 FEET MST
27 FEB. 69 0600 HRS MST
ASCENSION NO. 197

UPPER AIR DATA
0825003905
WHITE SANDS SITE

WSTM SITE COORDINATES
E 489, 580 FEET
N 185, 045 FEET

TABLE VII (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEWPPOINT DEGREES CENTIGRADE	REL.HUM. PERCENT	SPEED OF SOUND KNOTS	WIND DATA		INDEX OF REFRACTION
					GM/CUBIC METER	DIRECTION DEGREES (TN)	
18500.0	500.4	-18.5	-36.7	18.8	684.6	621.4	1.000154
19000.0	490.6	-19.6	-37.4	19.2	674.1	620.0	1.000152
19500.0	480.9	-20.6	-38.2	19.5	663.8	618.6	1.000149
20000.0	471.5	-21.9	-39.0	19.9	653.7	617.3	1.000147
20500.0	461.8	-23.1	-39.9	20.1	643.3	615.8	1.000144
21000.0	452.1	-24.3	-40.8	20.3	632.8	614.3	1.000142
21500.0	442.6	-25.5	-41.8	20.5	622.6	612.8	1.000140
22000.0	433.3	-26.7	-42.7	20.7	612.5	611.3	1.000137
22500.0	424.2	-27.9	-43.7	20.9	602.7	609.8	1.000135
23000.0	415.3	-29.2	-44.7	21.1	592.9	608.2	1.000133
23500.0	406.5	-30.4	-45.6	21.3	583.4	606.7	1.000131
24000.0	398.0	-31.6	-46.6	21.5	574.0	605.2	1.000128
24500.0	389.6	-32.8	-47.6	21.7	564.8	603.7	1.000126
25000.0	381.5	-34.0	-48.5	21.8	555.8	602.1	1.000124
25500.0	373.4	-35.1	-49.6	21.8**	546.6	600.7	1.000122
26000.0	365.2	-35.9	-51.2	19.4**	536.3	599.8	1.000120
26500.0	357.2	-36.6	-52.8	17.1**	526.2	598.9	1.000117
27000.0	349.4	-37.3	-54.6	14.9**	516.2	597.9	1.000115
27500.0	341.8	-38.1	-56.5	12.7**	506.5	597.0	1.000113
28000.0	334.3	-38.8	-58.7	10.5**	497.0	596.1	1.000111
28500.0	327.0	-39.6	-61.1	8.3**	487.7	595.1	1.000109
29000.0	319.8	-40.3	-64.0	6.1**	478.5	594.2	1.000107
29500.0	312.8	-41.0	-67.8	3.9**	469.5	593.2	1.000105
30000.0	306.0	-41.6	-74.2	1.6**	460.7	592.3	1.000103
30500.0	299.2	-42.7	0.	-0.**	452.4	591.1	1.000101
31000.0	292.5	-44.2	0.	-0.**	445.0	589.2	1.000099
31500.0	285.9	-45.6	0.	-0.**	437.8	587.3	1.000097
32000.0	279.5	-47.1	0.	-0.**	430.8	585.4	1.000096
32500.0	272.2	-48.5	0.	-0.**	423.7	583.6	1.000094
33000.0	266.8	-49.6	0.	-0.**	416.9	582.2	1.000093

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET
27 FEB. 69 0600 HRS MST
ASCENSION NO. 157

UPPER AIR DATA
CB25003905
WHITE SANDS SITE

WSTM SITE COORDINATES
E 488, 580 FEET
N 185, 045 FEET

TABLE VII (Cont.)

GEOMETRIC ALTITUDE MST. FEET	PRESSURE MILLIBARS	TEMPERATURE DEGREES C	AIR DEPOINT CENTIGRADE	REL. HUM. PERCENT	WIND DATA DIRECTION DEGREES (T)	SPEED KNOTS	INDEX OF REFRACTION
		METER	GM/CUBIC METER				
33500.0	260.7	-50.7	0.	-0. **	408.3	500.0	1.0000002
34000.0	254.7	-51.7	0.	-0. **	400.8	579.4	1.0000032
34500.0	248.8	-52.8	0.	-0. **	393.4	578.0	1.0000084
35000.0	242.0	-53.6	0.	-0. **	385.6	577.0	1.0000086
35500.0	237.4	-52.7	0.	-0. **	375.2	578.1	1.0000084
36000.0	231.9	-52.3	0.	-0. **	365.8	578.6	1.0000081
36500.0	226.4	-52.7	0.	-0. **	357.8	578.2	1.0000080
37000.0	221.1	-53.0	0.	-0. **	350.0	577.7	1.0000078
37500.0	215.9	-53.4	0.	-0. **	342.3	577.3	1.0000076
38000.0	210.9	-53.7	0.	-0. **	334.8	576.8	1.0000075
38500.0	205.9	-54.1	0.	-0. **	327.5	576.3	1.0000073
39000.0	201.1	-54.4	0.	-0. **	320.3	575.9	1.0000071
39500.0	196.4	-54.8	0.	-0. **	313.3	575.4	1.0000070
40000.0	191.8	-55.0	0.	-0. **	306.4	575.0	1.0000068
40500.0	187.3	-55.4	0.	-0. **	299.7	574.5	1.0000067
41000.0	182.9	-55.8	0.	-0. **	293.1	574.1	1.0000065
41500.0	178.6	-56.1	0.	-0. **	286.7	573.6	1.0000064
42000.0	174.4	-56.5	0.	-0. **	280.4	573.2	1.0000062
42500.0	170.3	-56.8	0.	-0. **	274.3	572.7	1.0000061
43000.0	166.3	-57.2	0.	-0. **	268.3	572.2	1.0000060
43500.0	162.4	-57.0	0.	-0. **	261.7	572.5	1.0000058
44000.0	158.5	-56.9	0.	-0. **	255.4	572.6	1.0000057
44500.0	154.7	-57.4	0.	-0. **	249.8	571.9	1.0000056
45000.0	150.9	-58.0	0.	-0. **	244.4	571.1	1.0000054
45500.0	147.3	-58.6	0.	-0. **	239.1	570.4	1.0000053
46000.0	142.7	-59.1	0.	-0. **	233.9	569.6	1.0000052
46500.0	140.2	-59.7	0.	-0. **	228.8	568.9	1.0000051
47000.0	136.3	-60.2	0.	-0. **	223.9	568.1	1.0000050
47500.0	132.5	-60.8	0.	-0. **	219.0	567.4	1.0000049
48000.0	130.2	-61.4	0.	-0. **	214.3	566.6	1.0000048

** AT EAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET MSL
 27 FEB. 69 C600 HR S MST
 ASCENSION NO. 197

UPPER AIR DATA
 0825003905
 WHITE SANDS SITE

WSTM SITE COORDINATES
 E 488,580 FEET
 N 185,045 FEET

TABLE VII (Cont)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEPOINT DEGREES CENTIGRADE	REL. HUM. PERCENT	SOUND METER KNOTS	WIND DATA			
					GM/CUBIC	DIRECTION DEGREES(TN)	SPEED KNOTS	INDEX OF REFRACTION
48500.0	127.1	-61.9	0.	209.6	565.9	258.8	57.5	1.000047
49000.0	124.0	-62.5	0.	205.1	565.1	258.0	57.2	1.000046
49500.0	121.0	-63.1	0.	200.6	564.4	256.9	58.0	1.000045
50000.0	118.0	-63.6	0.	196.3	563.6	255.7	59.3	1.000044
50500.0	115.2	-64.2	C.	192.1	562.9	253.0	59.2	1.000043
51000.0	112.4	-64.8	0.	187.9	562.1	250.1	59.0	1.000042
51500.0	109.7	-65.3	0.	183.8	561.3	248.0	59.1	1.000041
52000.0	107.0	-65.9	0.	179.9	560.6	246.1	59.2	1.000040
52500.0	104.4	-66.4	0.	176.0	559.8	245.3	58.9	1.000039
53000.0	101.9	-67.0	0.	172.2	559.1	245.2	58.1	1.000038
53500.0	99.4	-67.6	0.	168.5	558.3	245.9	57.7	1.000038
54000.0	97.0	-68.0	0.	164.6	557.7	248.3	58.0	1.000037
54500.0	94.5	-68.1	0.	160.7	557.5	250.7	58.3	1.000036
55000.0	92.2	-68.3	0.	156.8	557.3	253.3	59.2	1.000035
55500.0	89.9	-68.5	0.	153.0	557.1	256.0	60.1	1.000034
56000.0	87.6	-68.6	0.	149.2	556.8	257.3	57.7	1.000033
56500.0	85.4	-68.8	0.	145.7	556.6	258.6	55.1	1.000032
57000.0	83.3	-69.0	0.	142.2	556.4	260.5	50.6	1.000032
57500.0	81.2	-68.0	0.	138.0	557.7	262.6	45.5	1.000031
58000.0	79.2	-66.8	0.	133.8	559.4	266.2	40.3	1.000030
58500.0	77.3	-65.6	0.	129.7	561.0	271.2	35.3	1.000029
59000.0	75.4	-64.8	0.	126.0	562.0	276.7	30.7	1.000028
59500.0	73.5	-64.8	0.	123.0	562.0	283.8	28.1	1.000027
60000.0	71.7	-64.9	0.	120.0	561.9	290.9	25.4	1.000027
60500.0	69.9	-64.9	0.	117.0	561.9	296.8	23.0	1.000026
61000.0	68.2	-65.0	0.	114.2	561.8	302.6	20.6	1.000025
61500.0	66.6	-65.0	0.	111.4	561.8	307.3	18.1	1.000025
62000.0	64.9	-65.0	0.	108.7	561.7	310.9	15.3	1.000024
62500.0	63.3	-65.1	0.	106.0	561.7	314.0	12.7	1.000024
63000.0	61.8	-64.6	0.	103.2	562.3	311.7	11.1	1.000023

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET MSL
 27 FEB. 69 C600 HRS MST
 ASCENSION NO. 197

UPPER AIR DATA
 0825003905
 WHITE SANDS SITE

WSTM SITE COORDINATES
 E 488.580 FEET
 N 185.045 FEET

TABLE VII (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEWPOINT DEGREE'S CENTIGRADE	REL. HUM. PERCENT	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(1TN)	INDEX OF REFRACTION
63500.0	66.3	-61.3	0.	99.1	566.7	9.4
64000.0	58.8	-61.1	0.	96.6	567.0	8.7
64500.0	57.4	-61.5	0.	94.5	566.4	8.5
65000.0	56.0	-62.0	0.	92.4	565.8	8.6
65500.0	54.7	-61.1	0.	89.8	567.0	12.2
66000.0	52.4	-60.2	0.	87.3	568.2	79.9
66500.0	52.1	-59.3	0.	84.9	569.4	276.1
67000.0	50.8	-58.4	0.	82.5	570.6	273.5
67500.0	49.6	-57.9	0.	80.3	571.3	271.0
68000.0	48.4	-58.2	0.	78.5	570.9	265.9
68500.0	47.3	-58.5	0.	76.8	570.4	260.6
69000.0	46.2	-58.8	0.	75.0	570.0	253.0
69500.0	45.1	-59.2	0.	73.4	569.6	241.2
70000.0	44.0	-59.5	0.	71.7	569.2	229.3
70500.0	42.9	-59.8	0.	70.1	568.8	233.7
71000.0	41.9	-60.1	0.	68.5	568.4	245.7
71500.0	40.9	-60.4	0.	67.0	567.9	257.7
72000.0	39.9	-60.6	0.	65.5	567.7	262.8
72500.0	39.0	-59.3	0.	63.5	569.4	267.0
73000.0	38.0	-58.1	0.	61.6	571.1	271.2
73500.0	37.1	-56.3	0.	60.2	570.8	275.7
74000.0	36.2	-58.5	0.	58.8	570.4	280.3
74500.0	35.4	-58.6	0.	57.5	570.1	285.6
75000.0	34.5	-59.1	0.	56.2	569.7	294.0
75500.0	33.7	-59.4	0.	54.9	569.3	302.3
76000.0	32.9	-59.6	0.	53.7	569.0	309.7
76500.0	32.1	-59.9	0.	52.5	568.6	315.3
77000.0	31.4	-60.2	0.	51.3	568.2	320.9
77500.0	30.6	-60.5	0.	50.1	567.9	322.8
78000.0	29.9	-60.6	0.	49.0	567.6	321.0

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET MSL
27 FEB. 69 0600 HRS MST
ASCENSION NO. 197

UPPER AIR DATA
0825003905
WHITE SANDS SITE

WSTM SITE COORDINATES
E 488.580 FEET
N 185.045 FEET

TABLE VII (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEWPPOINT DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	DIRECTION DEGREES (TN)	WIND SPEED KNOTS	INDEX OF REFRACTION
78500.0	25.2	-60.3	0°	-0. **	47.8	568.0	319.2	10.2
79000.0	26.5	-60.0	0°	-0. **	46.6	568.5	319.1	10.4
79500.0	27.8	-55.7	0°	-0. **	45.4	568.9	320.0	11.1
80000.0	27.2	-59.4	0°	-0. **	44.3	569.3	320.9	11.7
80500.0	26.5	-55.1	0°	-0. **	43.1	569.7	309.1	8.9
81000.0	25.9	-58.7	0°	-0. **	42.1	570.2	293.2	4.9
81500.0	25.3	-58.4	0°	-0. **	41.0	570.6	277.2	1.0
82000.0	24.7	-58.1	0°	-0. **	40.0	571.0	275.1	2.1
82500.0	24.1	-57.8	0°	-0. **	39.0	571.4	275.1	4.1
83000.0	23.5	-57.5	0°	-0. **	38.0	571.9	275.2	6.1
83500.0	23.0	-57.1	0°	-0. **	37.0	572.3	275.2	6.6
84000.0	22.4	-56.8	0°	-0. **	36.1	572.7	275.3	7.1
84500.0	21.9	-56.5	0°	-0. **	35.2	573.1	276.2	7.6
85000.0	21.4	-56.2	0°	-0. **	34.3	573.5	291.1	9.3
85500.0	20.9	-55.9	0°	-0. **	33.5	574.0	305.9	11.1
86000.0	20.4	-55.6	0°	-0. **	32.6	574.4	321.0	12.3
86500.0	19.9	-55.2	0°	-0. **	31.8	574.8	337.3	10.4
87000.0	19.4	-54.9	0°	-0. **	31.0	575.2	353.6	8.4
87500.0	19.0	-54.6	0°	-0. **	30.2	575.6	3.3	7.2
88000.0	18.5	-54.3	0°	-0. **	29.5	576.1	353.9	8.2
88500.0	18.1	-54.0	0°	-0. **	28.7	576.5	344.5	9.1
89000.0	17.7	-53.5	0°	-0. **	28.0	577.0	339.2	9.4
89500.0	17.3	-53.1	0°	-0. **	27.3	577.6	343.0	10.3
90000.0	16.9	-52.7	0°	-0. **	26.7	578.2	346.8	10.6
90500.0	16.5	-52.2	0°	-0. **	26.0	578.8	350.2	10.7
91000.0	16.1	-51.8	0°	-0. **	25.4	579.3	353.1	10.0
91500.0	15.8	-51.3	0°	-0. **	24.7	579.9	355.9	9.3
92000.0	15.4	-50.9	0°	-0. **	24.1	580.5	358.3	8.5
92500.0	15.1	-50.5	0°	-0. **	23.5	581.1	359.5	7.3
93000.0	14.7	-50.0	0°	-0. **	23.0	581.6	0.7	6.1

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET MSL
27 FEB. 69 C600 HR S MST
ASCENSION NO. 157

UPPER AIR DATA
C825003905
WHITE SANDS SITE

W STM SITE COORDINATES
E 488, 580 FEET
N 185, 045 FEET

TABLE VII (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEWPOINT DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES (TN)	SPEED KNOTS	INDEX OF REFRACTION
93500.0	14.4	-45.6	0.	-0.	22.4	582.2	359.7	5.0
94000.0	14.1	-49.1	0.	-0.	21.9	582.8	352.5	3.9
94500.0	12.7	-48.7	0.	-0.	21.3	583.4	345.3	2.8
95000.0	12.4	-48.3	0.	-0.	20.8	583.9	325.0	2.2
95500.0	12.1	-47.8	0.	-0.	20.3	584.5	314.0	3.5
96000.0	12.8	-47.4	0.	-0.	19.8	585.1	293.0	4.8
96500.0	12.5	-46.9	0.	-0.	19.3	585.7	274.4	6.0
97000.0	12.2	-46.5	0.	-0.	18.8	586.2	265.4	6.6
97500.0	12.0	-46.0	0.	-0.	18.4	586.8	256.5	7.1
98000.0	11.7	-45.6	0.	-0.	17.9	587.4	249.0	7.7
98500.0	11.4	-45.2	0.	-0.	17.5	587.9	251.2	8.5
99000.0	11.2	-44.7	0.	-0.	17.0	588.5	253.4	9.3
99500.0	10.9	-44.3	0.	-0.	16.6	589.1	255.7	10.1
100000.0	10.7	-43.8	0.	-0.	16.2	589.6	261.3	10.6
100500.0	10.4	-43.4	0.	-0.	15.8	590.2	267.3	11.1
101000.0	10.2	-43.0	0.	-0.	15.4	590.8	273.3	11.6
101500.0	10.0	-42.5	0.	-0.	15.1	591.3	278.2	13.4
102000.0	9.7	-42.1	0.	-0.	14.7	591.9	282.3	16.3
102500.0	9.5	-41.6	0.	-0.	14.3	592.6	286.4	19.1
103000.0	9.3	-41.0	0.	-0.	14.0	593.2	290.1	21.7
103500.0	9.1	-40.5	0.	-0.	13.7	593.9	289.4	20.6
104000.0	8.9	-40.0	0.	-0.	13.3	594.5	288.7	19.4
104500.0	8.7	-39.5	0.	-0.	13.0	595.2	288.0	18.2
105000.0	8.5	-39.0	0.	-0.	12.7	595.8	287.7	17.8
105500.0	8.4	-38.5	0.	-0.	12.4	596.4	287.6	17.9
106000.0	8.2	-38.0	0.	-0.	12.1	597.1	287.5	18.1
106500.0	8.0	-37.5	0.	-0.	11.8	597.7	287.5	18.3
107000.0	7.8	-37.0	0.	-0.	11.6	598.4	288.1	15.3
107500.0	7.7	-36.5	0.	-0.	11.3	599.0	288.7	12.3
108000.0	7.5	-36.0	0.	-0.	11.0	599.7	289.3	9.3

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET MSL
 27 FEB. 69 0600 HRS MST
 ASCENSION NO. 197

UPPER AIR CATA
 0825003905
 WHITE SANDS SITE
 WSTM SITE COORDINATES
 E 488.580 FEET
 N 185.045 FEET

TABLE VII (Cont.)

GEOMETRIC ALTITUDE IN FEET	PRESSURE IN MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	SPEED OF WIND/CUBIC METER KNOTS	WIND DATA		INDEX OF REFRACTION
		AIR DEWPONT DEGREES	CENTIGRADE DEGREES			DIRECTION DEGREES(TN)	SPEED KNOTS	
108500.0	7.3	-35.5	0.	-0.	**	10.8	600.3	1.000002
109000.0	7.2	-35.0	0.	-0.	**	10.5	600.9	1.000002
109500.0	7.0	-34.5	0.	-0.	**	10.2	601.6	1.000002
110000.0	6.9	-33.9	0.	-0.	**	10.0	602.2	1.000002
110500.0	6.7	-33.4	0.	-0.	**	9.8	602.9	1.000002
111000.0	6.6	-32.9	0.	-0.	**	9.5	603.5	1.000002
111500.0	6.4	-32.4	0.	-0.	**	9.3	604.1	1.000002

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET MSL
 27 FEB. 69 C600 HRS MST
 ASCENSION NO. 197

MANDATORY LEVELS
 0825003905
 WHITE SANDS SITE

WSTM SITE COORDINATES
 E 428, 580 FEET
 N 185, 045 FEET

TABLE VIII

PRESSURE MILLIBARS	GEOPOTENTIAL FEET	TEMPERATURE DEGREES CENTIGRADE	REL. HUM. PERCENT	WIND DATA	
				AIR DEGREEES	DEGREEES (TN) DIRECTION KNOTS
850. C	4851.	9.8	-1.4	46.	333.0 6.9
800. C	6491.	5.6	-3.9	50.	292.0 18.1
750. C	8210.	1.2	-6.8	55.	286.6 20.5
700. C	10018.	-1.5	-17.5	29.	278.7 25.5
650. C	11951.	-3.6	-27.5	14.	279.8 29.0
600. C	14007.	-8.2	-30.1	15.	291.4 28.9
550. C	16202.	-13.1	-33.1	17.	293.8 28.5
500. C	18559.	-18.6	-36.7	19.	295.3 36.1
450. C	21107.	-24.6	-41.0	20.	291.8 35.0
400. C	23883.	-31.3	-46.4	21.	281.7 40.4
350. C	26943.	-37.3	-54.5	15.**	282.8 48.2
300. C	30399.	-42.5	0.	-0.**	280.8 50.2
250. C	34344.	-52.6	0.	-0.**	281.7 55.8
200. C	39060.	-54.5	0.	-0.**	274.2 72.0
175. C	41853.	-56.4	0.	-0.**	265.6 82.3
150. C	45554.	-58.1	0.	-0.**	267.9 76.9
125. C	48784.	-62.3	0.	-0.**	258.2 57.2
100. C	53250.	-67.4	0.	-0.**	245.4 57.7
80. C	57643.	-67.2	0.	-0.**	264.3 42.4
70. C	60310.	-64.9	0.	-0.**	296.7 23.1
60. C	63400.	-60.7	0.	-0.**	308.9 9.1
50. C	67126.	-57.8	0.	-0.**	271.8 19.3
40. C	71713.	-60.7	0.	-0.**	262.4 21.1
30. C	77624.	-60.7	0.	-0.**	321.3 10.7
25. C	81368.	-58.3	0.	-0.**	275.0 0.9
20. C	86007.	-55.3	0.	-0.**	332.8 10.9
15. C	92092.	-50.4	0.	-0.**	359.5 7.3
10. C	100924.	-42.6	0.	-0.**	277.5 12.9
7. C	1C8966.	-34.4	0.	-0.**	

** IF LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET MSL
27 FEB. 69 0900 HRS MST
ASCENSION NO. 198

SIGNIFICANT LEVEL DATA
0841003905
WHITE SANDS SITE

TABLE IX

PRESSURE MILLIBARS	GEOMETRIC ALTITUDE FEET MSL	AIR DEMPPOINT DEGREES CENTIGRADE	TEMPERATURE: AIR DEMPPOINT CENTIGRADE		REL.HUM. PERCENT
			REL.HUM. 0	REL.HUM. 100	
880.0	3939.0	10.0	-1.7	43.0	
864.0	4487.9	8.0	-4.1	42.0	
745.0	8445.4	0.1	-8.9	51.0	
718.0	9414.4	-1.6	-14.1	38.0	
707.0	9810.6	-0.6	-23.4	16.0	
672.0	11152.3	0.1	-23.0	10.0	
477.0	19835.4	-20.0	-40.1	15.0	
400.0	24041.8	-30.2	-47.0	18.0	
384.0	24992.5	-32.7	-49.1	19.0	
347.0	27314.6	-37.9	0.	-0.**	
240.0	35350.6	-56.1	0.	-0.**	
224.0	36797.7	-55.3	0.	-0.**	
213.0	37852.5	-56.7	0.	-0.**	
135.0	47337.9	-58.4	0.	-0.**	
120.0	45751.7	-62.4	0.	-0.**	
100.0	53434.6	-66.1	0.	-0.**	
95.0	54459.3	-66.5	0.	-0.**	
80.0	57931.6	-61.6	0.	-0.**	
72.0	60062.2	-66.3	0.	-0.**	
54.0	65914.7	-59.2	0.	-0.**	
45.0	69670.9	-61.1	0.	-0.**	
36.0	74291.9	-57.2	0.	-0.**	
28.0	89521.4	-59.2	0.	-0.**	
17.5	89398.5	-53.2	0.	-0.**	
11.5	98522.8	-44.8	0.	-0.**	
7.0	109768.7	-34.6	0.	-0.**	

** RELATIVE HUMIDITY NOT SUPPLIED. ZERO VALUE ASSUMED FOR COMPUTATIONS.

STATION ALTITUDE 3989.0 FEET MSL
27 FEB. 69 0900 HRS MSL
ASCENSION NO. 198

UPPER AIR DATA
0840034905
WITTE SANDS SITE

WSIM SITE COORDINATES
E 488.580 FEET
N 185.045 FEET

TABLE X

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MICRIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	REL.HUM. PERCENT	DENSITY GM/CUBIC	SPEED OF SOUND KNOTS	DIRECTION DEGREES (TIN)	WIND DATA INDEX OF REFRACTION
3989.0	280.0	10.0	-1.4	1080.3	656.0	30.0	0.0
6000.0	679.6	10.0	-1.7	1080.1	655.9	29.7	0.0
4500.0	863.6	8.0	-4.1	1068.2	653.5	17.9	0.8
5000.0	847.6	7.0	-4.7	1052.2	652.4	40.0	9.6
5500.0	831.9	6.0	-5.3	1036.4	651.2	354.2	10.3
6000.0	816.4	5.0	-5.9	1020.9	650.0	342.3	11.1
6500.0	801.3	4.0	-6.4	1005.6	649.8	326.4	11.4
7000.0	786.4	3.0	-7.1	990.6	647.6	307.9	11.4
7500.0	771.8	2.0	-7.7	975.8	646.4	299.0	13.0
8000.0	757.5	1.0	-8.3	961.2	645.2	293.2	15.2
8500.0	743.5	0.0	-9.1	950.3	946.0	291.7	17.3
9000.0	729.4	-0.9	-11.8	932.2	642.9	290.8	19.5
9500.0	715.6	-1.4	-15.5	916.6	642.2	291.7	21.7
10000.0	702.1	-2.5	-23.9	896.8	643.1	292.6	23.8
10500.0	688.9	-0.2	-25.5	879.1	643.4	293.1	25.6
11000.0	675.9	0.0	-27.4	861.8	643.7	293.6	27.3
11500.0	662.8	-0.7	-28.4	847.4	642.0	293.4	27.8
12000.0	649.9	-1.9	-29.0	10.5	834.4	641.4	293.1
12500.0	637.2	-3.0	-29.7	10.8	821.6	640.1	292.2
13000.0	624.7	-4.2	-30.3	11.1	809.7	638.7	291.3
13500.0	612.5	-5.3	-31.0	11.4	796.6	637.3	291.0
14000.0	600.6	-6.5	-31.6	11.6	784.5	635.9	290.7
14500.0	588.8	-7.6	-32.3	11.9	772.5	634.5	291.1
15000.0	577.3	-8.8	-33.0	12.2	760.4	633.2	291.5
15500.0	566.0	-10.0	-33.7	12.5	749.2	631.8	291.8
16000.0	555.0	-11.1	-34.4	12.8	737.9	630.4	292.0
16500.0	544.1	-12.3	-35.1	13.1	726.6	629.0	293.1
17000.0	533.5	-13.4	-35.8	13.4	715.5	627.6	294.2
17500.0	523.1	-14.6	-36.5	13.7	704.7	626.2	294.5
18000.0	512.8	-15.8	-37.3	13.9	694.1	624.8	294.9

STATION ALTITUDE 3989.0 FEET ASL
27 FEB. 69
ASCENSION NO. 198

UPPER AIR DATA
084100Z05
WHITE SANDS SITE

WSTM SITE COORDINATES
E 488.380 FEET
N 185.045 FEET

TABLE X (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEPOINT DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	DIRECTION DEGREES TN	WIND SPEED KNOTS	INDEX OF REFRACTION
18500.0	502.8	-16.9	-38.0	14.2	623.6	623.4	295.5	22.3
19000.0	493.0	-18.1	-38.8	14.5	623.3	621.9	296.2	24.6
19500.0	483.4	-19.2	-39.6	14.8	623.1	620.5	296.7	24.3
20000.0	473.7	-20.4	-40.3	15.1	622.9	619.1	297.5	24.2
20500.0	463.9	-21.6	-41.1	15.5	622.5	617.6	300.2	24.6
21000.0	454.3	-22.8	-41.9	15.8	622.2	616.1	302.9	25.3
21500.0	444.9	-24.0	-42.7	16.2	622.2	614.6	305.5	26.2
22000.0	435.7	-25.2	-43.5	16.5	612.3	613.1	307.9	27.9
22500.0	426.7	-26.5	-44.4	16.9	602.5	611.6	310.2	30.4
23000.0	417.8	-27.7	-45.2	17.3	593.0	610.1	311.2	31.8
23500.0	409.2	-28.9	-46.0	17.6	583.6	608.6	311.7	33.3
24000.0	400.7	-30.1	-46.9	18.0	574.4	607.1	310.5	35.6
24500.0	392.2	-31.4	-48.0	18.0	565.2	605.4	308.9	38.4
25000.0	383.9	-32.7	-49.1	17.9**	556.2	603.8	306.7	39.8
25500.0	375.6	-33.8	-52.2	14-1**	546.8	602.4	304.5	41.3
26000.0	367.5	-35.0	-55.7	10-2**	537.5	601.6	302.6	43.4
26500.0	359.6	-36.1	-60.4	6-3**	528.4	599.5	300.8	45.5
27000.0	351.8	-37.2	-68.2	2-4**	519.5	598.1	299.9	47.1
27500.0	344.1	-38.3	0-	0-**	510.5	596.7	299.2	48.7
28000.0	336.3	-39.5	0-	0-**	501.3	595.2	299.1	51.5
28500.0	328.6	-40.6	0-	0-**	492.3	593.8	298.7	53.7
29000.0	321.2	-41.7	0-	0-**	483.5	592.4	297.4	54.0
29500.0	313.9	-42.8	0-	0-**	474.9	590.9	295.7	53.2
30000.0	306.3	-44.0	0-	0-**	466.4	589.5	293.7	51.3
30500.0	299.8	-45.1	0-	0-**	458.1	588.0	291.2	50.4
31000.0	293.0	-46.2	0-	0-**	449.9	586.5	288.3	50.3
31500.0	286.4	-47.4	0-	0-**	441.9	585.1	286.4	52.4
32000.0	279.9	-48.5	0-	0-**	434.1	583.6	285.3	55.2
32500.0	273.5	-49.6	0-	0-**	426.4	582.1	284.6	58.0
33000.0	267.3	-50.8	0-	0-**	418.9	580.6	284.2	60.6

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET NSL
27 FEB. 69 0900 HRS MST
ASCENSION NO. 198

UPPER AIR DATA
0841003905
WHITE SANDS SITE

WSTM SITE COORDINATES
E 488.580 FEET
N 185.045 FEET

TABLE X (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEWPPOINT DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES (TIN) KNOTS	INDEX OF REFRACTION
33500.0	261.3	-51.9	0-	411.4	579.2	284.1	61.9
34000.0	255.3	-53.0	0-	404.2	577.7	284.4	62.0
34500.0	249.6	-54.2	0-	397.1	576.2	264.1	62.2
35000.0	243.9	-55.3	0-	390.1	574.7	283.3	62.7
35500.0	238.3	-56.0	0-	382.4	573.8	282.8	63.9
36000.0	232.7	-55.7	0-	372.9	574.1	282.9	66.7
36500.0	227.2	-55.5	0-	363.6	574.5	232.6	69.3
37000.0	221.8	-55.6	0-	355.2	574.4	261.1	71.3
37500.0	216.6	-56.2	0-	347.9	573.5	280.1	73.5
38000.0	211.5	-56.7	0-	340.5	572.8	280.8	75.9
38500.0	206.5	-56.8	0-	332.5	572.7	281.3	78.1
39000.0	201.6	-56.9	0-	324.8	572.6	280.3	78.3
39500.0	196.8	-57.0	0-	317.2	572.5	279.3	78.5
40000.0	192.1	-57.1	0-	309.8	572.4	278.5	78.7
40500.0	187.5	-57.2	0-	302.5	572.2	277.8	78.9
41000.0	183.1	-57.3	0-	295.5	572.1	275.8	79.1
41500.0	178.7	-57.4	0-	288.6	572.0	273.6	79.3
42000.0	174.5	-57.4	0-	281.8	571.9	272.3	80.6
42500.0	170.4	-57.5	0-	275.3	571.8	271.8	83.0
43000.0	166.3	-57.6	0-	268.8	571.6	271.0	85.2
43500.0	162.4	-57.7	0-	262.6	571.5	269.4	86.6
44000.0	158.5	-57.8	0-	256.4	571.4	267.7	88.0
44500.0	154.7	-57.9	0-	250.5	571.3	267.5	89.9
45000.0	151.1	-58.0	0-	244.6	571.2	267.6	91.9
45500.0	147.5	-58.1	0-	238.9	571.0	267.0	90.1
46000.0	144.0	-58.2	0-	233.3	570.9	266.0	85.5
46500.0	140.5	-58.2	0-	227.9	570.8	266.1	82.8
47000.0	137.2	-58.3	0-	222.6	570.7	267.2	81.6
47500.0	133.9	-58.7	0-	217.6	570.3	266.6	78.3
48000.0	130.7	-59.5	0-	213.2	569.2	264.2	72.8

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET HSL
27 FEB. 69 0900 HRS HST
ASCENSION NO. 198

UPPER AIR DATA
0841003905
WHITE SANDS SITE

WSIN SITE COORDINATES
E 488.580 FEET
N 185.045 FEET

TABLE X (Cont)

GEOMETRIC ALTITUDE HSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEWPOINT DEGREES CENTIGRADE	REL. HUM. DENSITY		SPEED OF WIND DATA METERS	WIND DATA DIRECTION DEGREES (TMA)	SPEED KNOTS	INDEX OF REFRACTION
			PERCENT	GA/CUBIC METER				
48500.0	127.6	-60.3	0.	-0.	208.8	568.1	261.7	69.0
49000.0	124.5	-61.1	0.	-0.	204.6	566.9	259.4	71.8
49500.0	121.5	-62.0	0.	-0.	200.5	565.8	257.0	74.5
50000.0	118.6	-62.7	0.	-0.	196.3	564.9	257.4	73.6
50500.0	115.7	-63.2	0.	-0.	191.9	564.2	257.7	72.2
51000.0	112.8	-63.7	0.	-0.	187.7	563.5	257.5	71.4
51500.0	110.1	-64.2	0.	-0.	183.6	562.8	256.7	71.2
52000.0	107.4	-64.8	0.	-0.	179.2	562.1	256.4	70.7
52500.0	104.7	-65.3	0.	-0.	175.6	561.4	258.0	68.8
53000.0	102.2	-65.8	0.	-0.	171.7	560.6	259.7	66.9
53500.0	99.7	-66.3	0.	-0.	167.9	560.0	259.2	66.0
54000.0	97.2	-66.4	0.	-0.	163.8	559.9	258.3	65.2
54500.0	94.8	-66.4	0.	-0.	159.8	559.8	260.1	63.7
55000.0	92.5	-65.7	0.	-0.	155.4	560.8	263.7	61.8
55500.0	90.2	-65.0	0.	-0.	151.1	561.7	267.7	58.8
56000.0	88.0	-64.3	0.	-0.	146.9	562.7	272.0	54.2
56500.0	85.9	-63.6	0.	-0.	142.8	563.6	276.4	49.7
57000.0	83.8	-62.9	0.	-0.	138.8	564.6	281.0	45.5
57500.0	81.7	-62.2	0.	-0.	135.0	565.5	285.6	41.2
58000.0	79.7	-61.8	0.	-0.	131.4	566.1	288.4	37.0
58500.0	77.8	-62.9	0.	-0.	128.9	564.7	270.5	32.7
59000.0	75.9	-64.0	0.	-0.	126.4	563.2	292.5	28.4
59500.0	74.0	-65.1	0.	-0.	124.0	561.7	289.2	22.9
60000.0	72.2	-66.2	0.	-0.	121.6	560.2	285.7	17.3
60500.0	70.5	-65.8	0.	-0.	118.4	560.7	280.3	12.6
61000.0	68.8	-65.2	0.	-0.	115.2	561.6	267.3	10.8
61500.0	67.1	-64.6	0.	-0.	112.1	562.4	254.3	9.0
62000.0	65.5	-63.9	0.	-0.	109.0	563.2	242.2	9.2
62500.0	63.9	-63.3	0.	-0.	106.1	564.0	230.7	10.6
63000.0	62.3	-62.7	0.	-0.	103.2	564.8	219.0	11.4

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3939.0 FEET
27 FEB. 69 0900 hrs MST
ASCENSION NO. 198

UPPER AIR DATA
0841003905
WHITE SANDS SITE

WEIM SITE COORDINATES
E 486.500 FEET
N 185.045 FEET

TABLE X (Cont.)

GEOMPHRIC ALTITUDE MST. FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	INDEX OF REFRACTION					
		AIR DEPOINT	DEGREES CENTIGRADE							
		DEGREES	KNUTS	DEGREES (TN)	KNUTS	REFRACTION				
63500.0	60.8	-62.1	0.	-0.	100.4	565.6	206.4	11.1	1.000022	
64000.0	59.3	-61.5	0.	-0.	97.7	566.4	193.5	11.1	1.000022	
64500.0	57.9	-60.9	0.	-0.	95.0	567.3	202.3	12.6	1.000021	
65000.0	56.5	-60.3	0.	-0.	92.5	568.1	247.2	13.8	1.000021	
65500.0	55.1	-59.7	0.	-0.	90.0	568.9	229.8	14.6	1.000020	
66000.0	53.8	-59.2	0.	-0.	87.6	569.3	238.4	15.0	1.000020	
66500.0	52.5	-59.5	0.	-0.	85.6	569.2	247.1	15.4	1.000019	
67000.0	51.2	-59.7	0.	-0.	83.6	568.8	254.6	18.3	1.000019	
67500.0	50.0	-60.0	0.	-0.	81.7	568.5	260.7	24.5	1.000018	
68000.0	48.8	-60.3	0.	-0.	79.9	568.1	266.0	30.6	1.000018	
68500.0	47.6	-60.5	0.	-0.	78.0	567.8	272.8	36.8	1.000017	
69000.0	46.5	-60.8	0.	-0.	76.3	567.5	273.5	35.2	1.000017	
69500.0	45.4	-61.0	0.	-0.	74.5	567.1	273.8	33.1	1.000017	
70000.0	44.3	-60.8	0.	-0.	72.7	567.4	274.1	31.1	1.000016	
70500.0	43.2	-60.4	0.	-0.	70.8	567.9	275.0	29.7	1.000016	
71000.0	42.2	-60.0	0.	-0.	69.0	568.5	276.7	28.9	1.000015	
71500.0	41.2	-59.6	0.	-0.	67.2	569.1	278.3	28.2	1.000015	
72000.0	40.2	-59.1	0.	-0.	65.5	569.6	279.9	27.5	1.000014	
72500.0	39.3	-58.7	0.	-0.	63.8	570.2	283.4	23.8	1.000014	
73000.0	38.3	-58.3	0.	-0.	62.1	570.8	287.0	20.0	1.000014	
73500.0	37.4	-57.9	0.	-0.	60.5	571.3	290.6	16.2	1.000013	
74000.0	36.5	-57.4	0.	-0.	59.0	571.9	298.5	13.4	1.000013	
74500.0	35.6	-57.3	0.	-0.	57.5	572.1	310.1	11.4	1.000013	
75000.0	34.8	-57.5	0.	-0.	56.2	571.8	321.7	9.3	1.000013	
75500.0	34.0	-57.7	0.	-0.	54.9	571.6	332.9	7.3	1.000012	
76000.0	33.2	-57.9	0.	-0.	53.7	571.3	343.6	5.4	1.000012	
76500.0	32.4	-58.0	0.	-0.	52.4	571.1	354.3	3.4	1.000012	
77000.0	31.6	-58.2	0.	-0.	51.2	570.8	348.2	2.6	1.000011	
77500.0	30.9	-58.4	0.	-0.	50.1	570.6	339.9	2.3	1.000011	
78000.0	30.1	-58.6	0.	-0.	48.9	570.3	329.0	2.3	1.000011	

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET MSL
27 FEB. 69
ASCENSION NO. 198

UPPER AIR DATA
0841003905
WHITE SANDS SITE

WSTRA SITE COORDINATES
E 488.580 FEET
N 185.045 FEET

TABLE X (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE DEGREES	AIR DEWPOINT DEGREES	REL.HUM. PERCENT	DENSITY G/CUBIC METER	SPEED OF SOUND KNOTS	DIRECTION DEGREES(TWA)	WIND SPEED KNOTS	INDEX OF REFRACTION
78500.0	29.4	-58.8	0.	**	47.8	570.1	309.1	3.7	1.000011
79000.0	28.7	-55.0	0.	**	46.7	569.8	289.1	5.2	1.000010
79500.0	28.0	-59.2	0.	**	45.6	569.6	280.3	6.5	1.000010
80000.0	27.4	-58.9	0.	**	44.5	569.9	280.2	7.8	1.000010
80500.0	26.7	-58.6	0.	**	43.4	570.3	280.2	9.0	1.000010
81000.0	26.1	-58.3	0.	**	42.3	570.7	291.1	8.0	1.000009
81500.0	25.5	-58.0	0.	**	41.3	571.1	303.6	6.7	1.000009
82000.0	24.9	-57.7	0.	**	40.2	571.5	314.3	5.7	1.000009
82500.0	24.3	-57.4	0.	**	39.2	571.9	317.4	6.2	1.000009
83000.0	23.7	-57.1	0.	**	38.3	572.4	320.5	6.7	1.000009
83500.0	23.2	-56.8	0.	**	37.3	572.8	330.9	7.6	1.000008
84000.0	22.6	-56.5	0.	**	36.4	573.2	351.4	8.9	1.000008
84500.0	22.1	-56.2	0.	**	35.5	573.6	11.9	10.3	1.000008
85000.0	21.6	-55.9	0.	**	34.6	574.0	24.4	11.3	1.000008
85500.0	21.1	-55.6	0.	**	33.7	574.4	16.0	11.3	1.000008
86000.0	20.6	-55.3	0.	**	32.9	574.8	7.6	11.2	1.000007
86500.0	20.1	-55.0	0.	**	32.1	575.2	359.1	11.2	1.000007
87000.0	19.6	-54.7	0.	**	31.3	575.6	5.8	12.1	1.000007
87500.0	19.2	-54.4	0.	**	30.5	576.0	15.5	13.1	1.000007
88000.0	18.7	-54.0	0.	**	29.7	576.4	25.2	14.2	1.000007
88500.0	18.3	-53.7	0.	**	29.0	576.8	29.5	14.3	1.000006
89000.0	17.8	-53.4	0.	**	28.3	577.2	25.3	12.7	1.000006
89500.0	17.4	-53.1	0.	**	27.6	577.6	21.1	11.4	1.000006
90000.0	17.0	-52.6	0.	**	26.9	578.2	17.0	9.5	1.000006
90500.0	16.6	-52.2	0.	**	26.2	578.8	18.3	9.0	1.000006
91000.0	16.3	-51.7	0.	**	25.6	579.4	20.4	8.6	1.000006
91500.0	15.9	-51.3	0.	**	24.9	580.0	22.5	8.2	1.000006
92000.0	15.5	-50.8	0.	**	24.3	580.6	29.2	7.6	1.000005
92500.0	15.2	-50.3	0.	**	23.7	581.2	45.0	6.6	1.000005
93000.0	14.8	-49.9	0.	**	23.1	581.8	60.9	5.5	1.000005

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET MSL
27 FEB. 69 0900 HRS MST
ASCENSION NO. 198

UPPER AIR DATA
0841003905
WHITE SANDS SITE

WSIM SITE COORDINATES
E 488.580 FEET
N 185.045 FEET

TABLE X (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE			REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA			INDEX OF REFRACTION
		AIR DEWPPOINT	DEGREES	CENTIGRADE				DIRECTION DEGREES (TN)	KNOTS	SPEED	
93500.0	14.5	-49.4	0.	-0.	**	22.6	582.4	76.7	4.5	1.000005	
94000.0	14.2	-49.0	0.	-0.	**	22.0	583.0	57.3	3.8	1.000005	
94500.0	13.8	-48.5	0.	-0.	**	21.5	583.6	27.4	3.1	1.000005	
95000.0	13.5	-48.0	0.	-0.	**	20.9	584.2	357.4	2.5	1.000005	
95500.0	13.2	-47.6	0.	-0.	**	20.4	584.8	341.3	2.3	1.000005	
96000.0	12.9	-47.1	0.	-0.	**	19.9	585.4	17.1	1.9	1.000004	
96500.0	12.6	-46.7	0.	-0.	**	19.4	586.0	53.0	5.6	1.000004	
97000.0	12.3	-46.2	0.	-0.	**	18.9	586.6	88.9	7.2	1.000004	
97500.0	12.1	-45.7	0.	-0.	**	18.5	587.2	133.7	8.4	1.000004	
98000.0	11.8	-45.3	0.	-0.	**	18.0	587.8	183.4	8.5	1.000004	
98500.0	11.5	-44.8	0.	-0.	**	17.6	588.4	233.2	8.9	1.000004	
99000.0	11.3	-44.4	0.	-0.	**	17.1	589.0	281.7	9.3	1.000004	
99500.0	11.0	-43.9	0.	-0.	**	16.7	589.5	287.2	9.2	1.000004	
100000.0	10.8	-43.5	0.	-0.	**	16.3	590.1	292.7	9.1	1.000004	
100500.0	10.5	-43.0	0.	-0.	**	16.0	590.7	298.2	9.1	1.000004	
101000.0	10.3	-42.6	0.	-0.	**	15.6	591.3	301.4	9.9	1.000003	
101500.0	10.1	-42.1	0.	-0.	**	15.2	591.9	299.9	12.4	1.000003	
102000.0	9.9	-41.6	0.	-0.	**	14.8	592.4	298.5	14.9	1.000003	
102500.0	9.6	-41.2	0.	-0.	**	14.5	593.0	297.1	17.3	1.000003	
103000.0	9.4	-40.7	0.	-0.	**	14.1	593.6	296.7	18.2	1.000003	
103500.0	9.2	-40.3	0.	-0.	**	13.8	594.2	296.9	17.9	1.000003	
104000.0	9.0	-39.8	0.	-0.	**	13.5	594.8	297.1	17.7	1.000003	
104500.0	8.8	-39.4	0.	-0.	**	13.2	595.3	297.4	17.5	1.000003	
105000.0	8.6	-38.9	0.	-0.	**	12.9	595.9			1.000003	
105500.0	8.5	-38.5	0.	-0.	**	12.5	596.5			1.000003	
106000.0	8.3	-38.0	0.	-0.	**	12.2	597.1			1.000003	
106500.0	8.1	-37.6	0.	-0.	**	12.0	597.6			1.000003	
107000.0	7.9	-37.1	0.	-0.	**	11.7	598.2			1.000003	
107500.0	7.7	-36.7	0.	-0.	**	11.4	598.8			1.000003	
108000.0	7.6	-36.2	0.	-0.	**	11.1	599.4			1.000002	

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

SATION ALTITUDE 3989.0 FEET MSL
27 FEB. 69 0900 HRS MST
ASCENSION NO. 198

UPPER AIR DATA
0841003905
WHITE SANDS SITE

MSTW SITE COORDINATES
E 488.580 FEET
N 105.045 FEET

TABLE X (Cont.)

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	DEPOINT CENTIGRADE	REL. HUM. PERCENT	SPEED OF SOUND METER KNOTS	DIRECTION DEGREES KNOTS	SPEED OF REFRACTION	INDEX OF REFRACTION
108500.0	7.4	-35.8	0.	00.	10.9	599.9	1.000002	1.000002
109000.0	7.2	-35.3	0.	00.	10.6	600.5	1.000002	1.000002
109500.0	7.1	-34.8	0.	00.	10.4	601.1	1.000002	1.000002

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET MSL
27 FEB. 69
ASCENSION NO. 198

MANUFACTORY LEVELS
0841003905
WHITE SANDS SITE

TABLE XI

PRESSURE MILLIBARS	GEOPOTENTIAL FEET	TEMPERATURE DEGREES CENTIGRADE	AIR DEWPOINT CENTIGRADE	REL. HUM. PERCENT	WIND DATA	
					DIRECTION DEGREES (TN)	SPEED KNOTS
850.0	4928.	7.1	-4.6	43.	7.7	9.4
800.0	6555.	3.9	-6.5	47.	324.3	11.4
750.0	8265.	0.5	-8.6	54.	292.1	16.3
700.0	10074.	-0.5	-24.1	15.	292.8	24.2
650.0	12016.	-1.9	-29.0	10.	293.0	27.9
600.0	14086.	-6.5	-31.6	12.	290.8	26.2
550.0	16294.	-11.6	-34.7	13.	292.7	26.5
500.0	18664.	-17.2	-38.3	14.	295.8	25.1
450.0	21224.	-23.4	-42.3	16.	304.4	25.8
400.0	24013.	-30.2	-47.0	18.	310.4	35.8
350.0	27083.	-37.5	-71.6	2.**	299.7	47.5
300.0	30512.	-45.1	0.	-0.**	290.8	50.4
250.0	34435.	-54.1	0.	-0.**	284.2	62.2
200.0	39092.	-56.9	0.	-0.**	280.0	78.4
175.0	41863.	-57.4	0.	-0.**	272.4	80.4
150.0	45054.	-58.0	0.	-0.**	267.6	92.5
125.0	48809.	-61.0	0.	-0.**	259.7	71.3
100.0	53297.	-66.3	0.	-0.**	259.3	66.4
80.0	57769.	-61.6	0.	-0.**	288.1	37.6
70.0	60449.	-65.6	0.	-0.**	277.1	12.1
60.0	63551.	-61.8	0.	-0.**	300.0	11.7
50.0	67284.	-60.0	0.	-0.**	260.7	24.5
40.0	71848.	-59.0	0.	-0.**	280.6	26.8
30.0	77196.	-58.7	0.	-0.**	325.6	2.5
25.0	81555.	-57.8	0.	-0.**	312.9	5.7
20.0	86204.	-54.9	0.	-0.**	358.1	11.2
15.0	92297.	-50.1	0.	-0.**	51.6	6.2
10.0	101146.	-41.9	0.	-0.**	299.6	13.0
7.0	109197.	-34.6	0.	-0.**		

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

WSTM SITE COORDINATES
E 488.580 FEET
N 185.045 FEET

RELEASE TIME (MST)	PIBAL SONDE	SECOND-STAGE IMPACT DISPLACEMENT IN MILES DUE TO WIND 11-216 FT 216-4270 FT 4270-72260 FT						TOTAL	AZI-MUTH (DEGREES)	THEORETICAL IMPACT FROM LAUNCHER (IN MILES)
		N-S	E-W	N-S	E-W	N-S	E-W			
0600	0700	3.4N	0.1E	9.7N	13.2W	2.2S	35.3W	10.9N	48.4W	331.0
0600	0730	3.0N	1.9E	10.1N	13.1W	2.2S	35.3W	10.9N	46.5W	332.4
0600	0800	7.5N	4.4E	13.8N	2.1E	2.2S	35.3W	19.1N	28.8W	349.6
0600	0815	11.1N	2.6E	18.0N	2.7E	2.2S	35.3W	26.9N	30.0W	349.7
0600	0830	10.6N	3.7E	21.2N	3.9E	2.2S	35.3W	29.6N	27.7W	351.8
0600	0845	13.1N	2.0E	20.9N	2.4E	2.2S	35.3W	31.8N	30.9W	349.7
0600	0855	11.0N	4.8E	21.6N	4.0E	2.2S	35.3W	30.4N	26.5W	352.8
0600	0905	11.2N	3.2E	20.6N	2.8E	2.2S	35.3W	29.6N	29.3W	350.6
*0900	*0914	12.9N	2.3E	22.2N	2.8E	1.2N	39.1W	36.3N	34.0W	348.2

LAUNCHER SETTING (ELEVATION 86.5 DEGREES QE)	AZI-MUTH (DEGREES)	MILES FROM LAUNCHER
NO WIND IMPACT	025.0	50.8
PREDICTED SECOND-STAGE IMPACT	018.9	49.0
SECOND-STAGE IMPACT, SOTIM**	350.0	75.0
PREDICTED BOOSTER IMPACT	349.1	83.3
ACTUAL BOOSTER IMPACT	N/A	N/A

TABLE XII. IMPACT PREDICTION DATA
NIKE-HYDAC STV-84

*Post-shoot Data

**Sonic Observation
of the Trajectory
and Impact of
Missiles.

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of this, body of abstract and indexing annotation must be entered when this security report is classified)

1. ORIGINATING ACTIVITY (Capitalize author)		2a. REPORT SECURITY CLASSIFICATION
U. S. Army Electronics Command Ft. Monmouth, New Jersey		UNCLASSIFIED
3. REPORT TITLE		3a. GROUP
METEOROLOGICAL DATA REPORT, NIKE-HYDAC STV-84		
4. DESCRIPTIVE NOTES (Type of report and inclusive dates)		
5. AUTHOR(S) (First name, middle initial, last name)		
Gordon L. Dunaway		
6. REPORT DATE		7a. TOTAL NO. OF PAGES
March 1969		35
7a. CONTRACT OR GRANT NO.		7b. NO. OF REFS
		NONE
8. PROJECT NO.		9a. ORIGINATOR'S REPORT NUMBER(S)
DA Task 1T665702D127-02		DR-410
9.		9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)
10. DISTRIBUTION STATEMENT This document is subject to special export controls and each transmittal to foreign governments or foreign nationals may be made only with prior approval of Atmospheric Sciences Office, White Sands Missile Range, New Mexico.		
11. SUPPLEMENTARY NOTES		12. SPONSORING MILITARY ACTIVITY
		U. S. Army Electronics Command Atmospheric Sciences Office White Sands Missile Range, New Mexico
13. ABSTRACT		
Meteorological data gathered for the launching of Nike-Hydac STV-84 are presented for the Space and Missile Systems Organization, AFMDC, Holloman Air Force Base, New Mexico, and for ballistic studies. The data appear, along with calculated ballistic data, in tabular form.		

DD FORM 1473 1 NOV 66
REPLACES DD FORM 1473, 1 JAN 64, WHICH IS
CBOLETE FOR ARMY USE.

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Security Classification

UNCLASSIFIED

Security Classification

16. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
1. Ballistics 2. Meteorology 3. Wind						

UNCLASSIFIED

Security Classification